

## Special Issue

# Rolling Contact Fatigue and Wear of Rails and Wheels

### Message from the Guest Editor

Railway systems involve contact between rolling wheels and the rail. Under a cyclic wheel passage, these lead to the perpetual initiation of cracks known as “rolling contact fatigue” (RCF) and wear in both surfaces, and these are major damages for wheels and rails. In the initiation and early propagation stages of cracks, crack propagation competes with wear. The mechanism that initiates cracks depends on factors such as the geometry of the rail and wheel, properties of their steels, and the type of traffic and lubrication. At the same time, wear changes the shape of both surfaces, thereby altering the wheel–rail contact region and associated contact stresses. When the wear rate is much greater than the crack growth rate, cracks cannot propagate and, in some cases, are effaced. Conversely, very low wear rates have a negligible influence on crack growth. This Special Issue calls for up-to-date studies on the RCF and wear of rails and wheels, especially the interactions between them. Papers that include on-site measurements are also encouraged.

### Guest Editor

Prof. Dr. Makoto Akama

Department of Mechanical Engineering for Transportation, Osaka Sangyo University, Daito, Japan

### Deadline for manuscript submissions

31 December 2025



## Machines

an Open Access Journal  
by MDPI

Impact Factor 2.5  
CiteScore 4.7



[mdpi.com/si/220987](https://mdpi.com/si/220987)

*Machines*  
Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[machines@mdpi.com](mailto:machines@mdpi.com)

[mdpi.com/journal/  
machines](https://mdpi.com/journal/machines)





# Machines

---

an Open Access Journal  
by MDPI

---

Impact Factor 2.5  
CiteScore 4.7



[mdpi.com/journal/  
machines](https://mdpi.com/journal/machines)



## About the Journal

### Message from the Editor-in-Chief

*Machines* is an international, peer reviewed journal on machinery and engineering. It publishes research articles, reviews and communications. Our aim is to encourage scientists to publish their experimental and theoretical results in as much detail as possible. There is no restriction on the length of the papers. Full experimental and/or methodical details must be provided. There are, in addition, unique features of this journal: Manuscripts regarding research proposals and research ideas will be particularly welcomed; Electronic files or software regarding the full details of the calculation and experimental procedure - if unable to be published in a normal way can be deposited as supplementary material.

---

### Editor-in-Chief

Prof. Dr. Antonio J. Marques Cardoso  
CISE - Electromechatronic Systems Research Centre, University of  
Beira Interior, Calçada Fonte do Lameiro, P-6201-001 Covilhã, Portugal

---

### Author Benefits

#### High Visibility:

indexed within Scopus, SCIE (Web of Science), Inspec, and other databases.

#### Journal Rank:

JCR - Q2 (Engineering, Mechanical) / CiteScore - Q1  
(Control and Optimization)

#### Rapid Publication:

manuscripts are peer-reviewed and a first decision is provided to authors approximately 16.9 days after submission; acceptance to publication is undertaken in 2.4 days (median values for papers published in this journal in the first half of 2025).